AMATEUR RADIO

Published in the interests of the Wireless Institute of Australia, Official Organ of all divisions of the W.I.A. and R.A.A.F.W.R.

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OCTOBER, 1939

AMATEUR RADIO

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EDITORIAL

War—suspended experimental licences—silent transmitters! What conflicting emotions are set up by those words and all that they mean. September, 1939, will live in all our memories as a period that can never be forgotten. August, 1914, to so many of us has been merely "the beginning of the World War," it was to us a month of historical importance.. But this month, September 1939, personally effects us all, our normal lives, our homes, our work and —our Hobby.

How often we have glibly spoken of the value of Amateur Radio as a huge training ground for operators who would be of value in time of war; of our R.A.A.F. Wireless Reserve, manned by Hams, voluntarily training themselves with their equipment to serve their Country should the need ever arise. The need HAS arisen, and with a feeling of unbounded pride, we write of the spontaneous response from the Australian Amateur. From one end of the country to the other, from cities and farms, the Hams have come to offer their Services to the Allied Cause. No light-hearted adventure this, but the grim business of War, for Patriotism must go more than skin deep for men to leave homes and good jobs, some of them one man businesses, and farms, to answer the call of Duty.

We are in this War to the bitter end, and only when victory is ours can we return to the days now past. In the meantime, Amateur Radio has difficult problems to meet, the holding together effectively of our Wireless Institute, the maintenance of contact with all members whereever they might be.. Our Magazine takes on a greater significance as the sole means of keeping each of us in touch with the other. We hope to record month by month something of what the Hams of Australia, and of the Empire, are doing in the Cause of Freedom so that in the end we will have preserved for all time a record of the finest achievements in Amateur History.

Some members of the Magazine Committee have already been called up for Service, but as far as is practicable, all plans that have been formulated for the future will be carried on taking due regard to continuously changing conditions and circumstances.

To those, who for reasons of age or physical infirmity, cannot enlist, there is no need to feel disheartened over the immediate future of the Institute and our Hobby. Federal Headquarters and the Federal Council are actively at work endeavouring to see that every phase of our Institute's usefulness is placed at the disposal of the appropriate authorities. For A.R.P. and Red Cross work, for training W/T and D/F operators there are fields of service for everyone. In our Hobby itself, too, there are big opportunities in receiver, aerial and oscilloscope experimentation, to say nothing of the immense value lying in research into the more effective suppression of man made interference.

Our policy, individually as well as an Institute, must be to carry out in principle the Prime Minister's injunction to "CARRY ON."

Reorganisation

Our Work and Prospects for the Future

The Wireless Institute of Australia has received many setbacks and problems in the past, but none more serious than the Departmental decision to cancel all Experimental Licenses during the continuance of hostilities.

What is our present attitude to the changed conditions now that we have had an apportunity to review the situation? Are we to quietly fold our hands and say as philosophically as possible, "Well the game's settled," or to face the future with a genuine conviction that such a problem is not unsurmountable, to a well organised and versatile group of enthusiasts. The dynamic quality needed by us all, if the Institute is to continue to function, is a determination to maintain our interest in Amateur Radio even though we are denied the pleasure of "getting on the air."

This interest can only be maintained if all the members assist their Divisional Councils to promote a progressive policy for the future. The time is now opportune for the formation in each State, of a section of our members, who will undertake to forward weekly or monthly reports of conditions on the short waves, say from 1500 KC to 56 MC, to their divisional secretary, or notes secretary for publication in "Amateur Radio."

The receipt of this information will not only enable us to continue to publish our magazine, but will assist us to attract the better type of Short Wave Listener to read "Amateur Radio," and probably join our rank, to be future hams in fact.

As soon as this monitoring organisation can be established, we can offer our assistance to the Secretary for Defence on a Federal basis, with a view to policing these bands, and at the same time keeping our members in touch with short wave conditions generally.

There is now an excellent opportunity offering for us to develop experimental groups in each Division, to investigate receiving problems—short wave direction finding technique—56 MC receivers and beam aerials for reception, etc. It would be a forward move if each Division could obtain a signal generator cathode ray oscilliscope and suitable apparatus to equip a testing and calibrating laboratory. There should be plenty of opportunity to develop group experimentation on receiving problems, and to extend our knowledge of general fundamentals with the assistance of such equipment. It seems likely that we will have to arrange more lectures at which demonstrations will be made, if our meetings are to be attractive.

Code classes and "ladders" will also make our section meetings more instructive and interesting. Federal Headquarters has already been in touch with the Post Master General's Department, and has suggested our ability to promote classes for radio operators, who would later be of great value to the various services, a practical avenue of service for the Institute to undertake.

Naturally, the situation is being watched very carefully, and no opportunity will be lost to bring the Institute's organisation to the attention and assistance of the proper authorities.

As soon as possible, we will endeavour to induce the Post Master General's Department to state their policy towards the Amateur, with reference to our status after the war is over.

Most Amateurs felt it keenly when they received a brief note explaining that after the expiration of their existing licences they would have to take out ordinary Broadcast Listeners' Licences.

Whilst this seems like rubbing it in, it is obvious that the Department cannot logically accept our present experimental licence fee, when we receive only the ordinary facilities obtained by the broadcast listener.

What seems most likely, however, is that we will obtain a reallocation of our call and licences after the war is over, provided that we are still able to satisfy the Department of our technical ability.

This is another important reason why we should seek to maintain our Institute, as we will need to possess an organisation to promote technical education, and also to place our unified requests before the Authorities for our reinstatement as Experimental Licencees.

Your magazine is the best medium for maintaining your interest in "Radio," and the Institute; we count on your continued support in this direction.

The Amateur has shown his qualities in no uncertain manner in the R.A.A.F. Wireless Reserve, Bush Fire and Flood Emergency Communications Networks, and will continue to meet his problems in that characteristic way which he has developed when facing difficulties such as confront us to-day.

W. R. GRONOW,

Federal President, W.I.A.

RANDOM NOTES.

Eric W. Trebilcock (B.E.R.S.195), the world-famous S.W.L., who for two years held the B.E.R.U. Challenge S.W.L. Cup, has joined the ranks of the Hams, and is now VK5TK. His QTH was Tennant Creek, Northern Territory (400 miles north of Alice Springs) where he was senior telegraphist, but before the gear for his xmtr arrived, he hooked an aeradio job in the Civil Aviation Department.

His next QTH is uncertain, but will probably be one of the Islands; he delights in out-of-the-way places! If you contact him, don't be afraid to QRQ 35 w.p.m. won't worry him.

No, he is not a relative of VK3TL.

Receiver Design

By E. M. Fanker, M.I.R.E. (Aust.), VK2HS

Chief Engineer: Thom & Smith Ltd., Sydney

Receivers for the U. H. F. Bands may be divided into three major types, namely (1) the T. R. F. type, (2) the super-regenerative type, and (3) the superheterodyne type.

The T. R. F. type has been neglected on this band, but lends itself very suitably for U. H. F. work. However, suitable components must be used. The big disability is a supply of suitable tubes. The only types suitable are the **Acorn Series**, but it would seem that their high cost has been the reason for the T. R. F. type of receiver being neglected.

Coil design for this type of receiver is important, and maintaining stability becomes difficult. In addition, feed-back and interstage interaction increases in proportion to the increase in frequency. Selectivity is not yet a serious problem out here.

However, a T. R. F. is difficult to adapt for adding a noise silencer to, and such an addition is very necessary for U.H.F. work because of automobile interference.

The Super-regenerative receiver has the advantage of being simple to construct, requires very few tubes and parts, and has quite high sensitivity. Another feature is its inherent A.V.C. characteristic and ability to discriminate against automobile interference. However, it has the disability of having a high noise level, and is very broad in tuning.

Finally, there is the Superheterodyne receiver. It is the logical answer for the U.H. Frequencies as well as for other frequencies.

Construction of a **Superhet. Stage by Stage.**

1. The **Input Stage** is most important in this type of receiver, because it is here where the discrimination between receiver and signal noise takes place. The higher the gain before the frequency changing valve, the better the signal to noise ratio.

It is desirable to have a **R.F. Stage** before the frequency converter, and the first point that one must consider is the type of tube to use. Here again the **Acorn** is the most desirable type. The reason is because it has a very high input admittance, despite the fact that it has a lower mutual conductance than the 1851 series.

At low frequencies we have been accustomed not to worry about input admittance, because all it did was to add capacity to the circuit which usually did very little harm. However, at High Frequencies and U.H. Frequencies this is not the case. The input admittance is no longer very high, but quite low, and it decreases as the frequency is increased.

There are three main causes for this decrease in input resistance. Firstly, the inductance in leads (especially the cathode lead) causes the admittance to drop, and as the frequency increases so does degenera-

tion increase, and any degeneration will reduce the gain. Secondly, the **Electron Transit Time** reduces the input admittance, and at these high frequencies the electron transit time becomes quite appreciable. This is another factor which helps reduce the gain. Thirdly, the effect of **Capacity in the Tube** reduces the input admittance. It is more than apparent capacity given in the tube booklets, and depends on the quality of the tube base and socket, too.

Gain is directly related to the input admittance and the mutual conductance of a tube. An increase in one means a decrease in the other, thus one offsets the other. For these reasons the **Acorn** is the **Natural Choice.**. However, if they are too expensive, then the next best thing is to choose a valve with as high a mutual conductance as possible, and get the gain from the tuned circuits.

In order to get selectivity, the ratio of inductance to capacity should not be high. However, in the **Radio Frequency** stages it is more important to get high gain, and this is only possible by using a **High Ratio L/C.** The selectivity may be got later on, by paying attention to the intermediate frequency stages of the receiver.

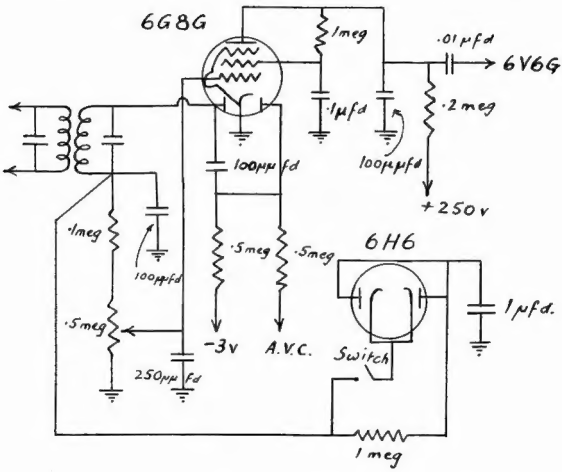
The following precautions should be observed. Leads must be short, all stray capacities to ground should be minimised by mounting components on stand-off insulators wherever posible, and the grid connection should be tapped down on the coil to get a better impedence match.

The type of coupling in the antenna coil depends, of course, on the type of antenna. Short antennas may be capacity fed to the grid of the tube. However, if a low impedance antenna is used then it is best coupled to the secondary by two or three turns at the low potential end of that winding.

The type of R.F. Tube has already been discussed. The best **Type of Coupling** between the **R.F. Tube** and **First Detector** is achieved by interwinding the primary coil with the secondary and having about the same number of turns.

2. The Frequency Converter or **First Detector.** Here again the **Acorn Tube** is the most desirable tube, especially if no R.F. stage has been used. It is essential to have a **Quiet Tube** in this position. The main cause of noise arising in the converter stage of a superhet is the shot effect produced due to the plate current flowing in that tube. Therefore, the **Logical Choice** is a **Tube with High Mutual Conductance** and **Low Plate Current.** Television penthodes are very good in this stage

of the receiver, especially if the valve is biassed so that it operates with the same mutual conductance as an ordinary converter valve. Operating in this condition there will be an appreciable reduction in noise. The best way to introduce the oscillator in conventional circuits. The 6J8 is more stable, but if all the advantages of this tube are to be gained, it is essential that the **First I.F. Transformer** be of a special type. The **Primary** must have a high inductance to capacity ratio so that the



THE "DICKETT" NOISE SILENCER.

voltage in this type of tube is to capacity couple the oscillator to the control grid of the converter tube.

Of the other types available the 6A7 seems the worst, because of the poor mutual conductance of the triode portion of the tube and also because of interlocking in the tube itself. The 6K8 behaves quite well

plate impedance of this tube, which is 4 megohms may be more nearly matched.

3. **The Intermediate Frequency Stages.** The first question is the choice of a suitable frequency. Originally it was the custom to use low frequencies. However, as the signal frequency is increased it is

increasingly difficult to get good image suppression. As this feature is most important in a receiver for the U.H. Frequencies, a comparatively high intermediate frequency is recommended for this style of receiver. In addition, the receiver is often called upon to receive unstable signals and extreme selectivity is not needed. An intermediate frequency of 3 mc would be admirable from an image interference point of view, but the gain from such I.F. Transformers is low. It would appear that 1600 KC is a good compromise, providing good gain and quite fair image suppression. In addition, 1600 KC seems to be a frequency that is clear of commercial services, so that there is very little chance of a signal riding straight through on the I.F. channel. In addition, good selectivity for the U.H.F. Bands is obtained using an I.F. of this frequency.

The maximum number of stages should be two. The set will be found to be too noisy if the gain is got from the I.F. Stages. The only reason to recommend two stages in such a receiver is that the set may be required to work on 14 mc and 7 mc, too. However, in order to get good results the maximum possible gain should be got from the R.F. stages, and the I.F. Stages used to obtain selectivity.

One stage of I.F. amplification should prove quite adequate. Special I.F. Transformers have been designed for this purpose and used with great success by 2NO. They have a very high L/C ratio, and the tuning capacity is only 15 mfd. The sensitivity in a conventional receiver using one stage of I.F. amplification at 1600 KC was 40 microvolts from the grid of the frequency changer.

Continued on page 28

The Volunteer Coastal Patrol

By M. M. Lusby, VK2WN, VLH3.

(Editor's Note:—This article was contributed before the war and contained the sense of how the ham could assist in the defence of the country in peace time, and in the event of war. The Volunteer Coastal Patrol is a unit of Yachtsmen and amateur operators, whose activities are presented below. We have had to delete the opening paragraph owing to the change of front since the contribution was received, otherwise the story is as written by 2WN).

. . . . the Yachtsmen showed us the way. They really conduct their hobby with the same motive as we do ours. They possess vessels and boat handling knowledge and spend their leisure hours enlarging their experience. Just like us with our Radio.

Messrs. H. W. G. Nobbs and W. Giles started the ball rolling, and under the guidance of Captain Maurice Blackwood, R.N. (Retired), Sydney's Yachtsmen were organised with their vessels, large and small, into divisions and flotillas.

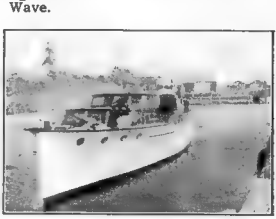
The vessels were drilled in formation work, and special manoeuvres, communications being by flag hoists semaphore. They were very effective, too—in daylight, but not at night.

A fact brought home early in the piece was that patrol boats, such as these, would be of greatest value at night time, reporting enemy positions or mine sweeping, etc. That's where we came in—to assist in the communications at night.

The W.I.A., N.S.W. Division was approached by Mr. R. H. W. Power, a one-time secretary of the division, and now an Executive Officer of the V.C.P. A number of Hams joined up. Radio equipment and mast headlights were taken to sea a couple of weeks later. The experience showed how useful these forms of communication could be made. More Hams joined up, and we were subsequently granted special Licenses and Frequencies by the P.M.G.'s Department.

The call signs consist of the letters VLH followed by a single numeral. Two types of equipment were developed, the first an electron coupled MOPA, and the second a Crystal controlled two stage affair. Suppressor Grid Modulation is used.

The Yachtsmen have shown great aptitude in assimilating the Morse Code, and likewise we have been picking up much helpful dope on the running of boats, navigation, flags signals, etc., not to mention the lighter side of life on the Ocean Wave.



M.V. "Silver Cloud" bringing Military Officers back from Coastal Reconnoitre—in Wollongong Harbour.

A number of successful cruises have been conducted, Sydney to Wollongong and Broken Bay. We have co-operated with the army on several occasions, notably the Coastal Defence exercises of the 9th Brigade off Wollongong early this year.

On a recent occasion, the exercises were observed by Mr. Spender, M.H.R., who expressed keen appreciation at the efficiency and precision of the various movements. This in-

spection took place at Broken Bay, and followed all night exercises in the course of which an "Enemy Raider" was apprehended by one of the protective patrols. It was trying to "Run the Blockade," and blow up the Hawkesbury River Bridge.

Two day exercises are conducted over the week-end once every two months, and night or afternoon manoeuvres are held on intervening occasions. We have our own Rifle Club (optional), and our headquarters are now established at an ideal location—Snapper Island.

M.V. "Pelorus"
A moderate sized Cruiser.

Snapper Island is a Naval Training Depot, built by boys on a rock in Sydney Harbour. It required the blasting of 1000 tons of rock and reclaiming a vast area of sea bed. The workmanship displayed in the structure of the buildings is worthy of many skilled craftsmen. The boys work under the expert guidance of Commander Forsythe, a retired Naval Officer. The main buildings occupy over 6000 square feet, and are formed along the lines of a Man o' War, with Bridge, look-out, main and quarter decks, etc.

Meetings are held on alternate Monday nights, and we are transported across the water in a large naval pinnace manned by efficient trainees of the depot.

At present there is a shortage of Qualified Radio men, and anyone interested is invited to get in touch with the writer at 10 Leeton Avenue, Coogee, or 'phone FX 2303.

Branches have been formed in Brisbane and Melbourne, and interested persons should communicate with Mr. J. J. Nixon, c/o Paul and Grey Ltd., 82 Eagle Street, Brisbane, or Mr. J. Beverage, c/o Rickard and Co. Ltd., Elizabeth Street, Melbourne, who are the Regulating Officers for those territories.

Have a look at the photos before you turn over. They illustrate typical types of cruisers carrying out manoeuvres.

IMPORTANT NOTICE.

Don't forget to advise your Divisional Secretary of changes in your address. The P.M.G. monthly call list will now be suspended, and this information will not be readily available except from members themselves.

VK7WI

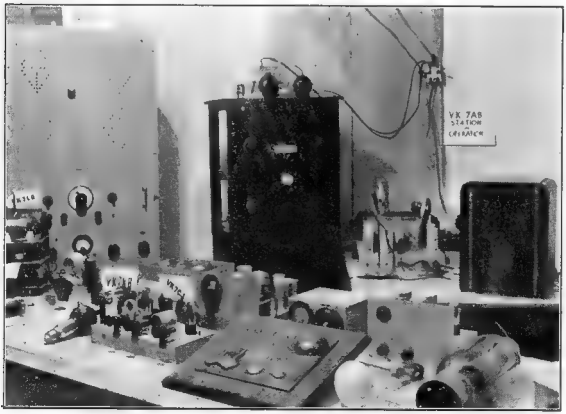
During the Radio and Electrical Exhibition held in Launceston during June, the Northern Zone of the WIA, Tasmanian Division, with VK7WI were responsible for a considerable amount of interest being aroused in Amateur Radio.

The display centred around an actual amateur station in operation, and exhibits of typical amateur apparatus constructed by 7CL, 7KR, 7CJ, 7LG, 7GJ, 7LZ, and 7BQ arranged on a stand in front of the working exhibit. A large size map of the world was shown with tapes leading down from several rare countries to their respective cards on one end of the stand.

VK7AB was the station used under the call sign of 7WI. The transmitter consisted of an EL5 tritet crystal oscillator capacitive coupled to an 807 and link coupled to an Eimac 35T running at an input of 50 watts and modulated by a pair of Osram PX 25's in Class AB push pull.

The receiver was a normal 10 tube super and the antenna a full wave 40 metre zepp.

All costs of installation were borne by the Launceston City Council, who gave us every assistance possible, and erected a very fine antenna.



Amateur Radio VK7WI as in operation from the Electrical and Radio Exhibition, Launceston.

Great interest was shown by the public at all times, especially with the duplex telephony carried out with VK7XL and VK7BQ. We are greatly indebted to VK7XL (Mr. Geo. Groves), who at that time was a non-member of the W.I.A., for his assistance in standing by at all times to contact us when conditions were unfavorable for outside contacts.

High noise level prevented us from making very many DX QSO'S, but several American amateurs were contacted. Probably our best DX were three contacts with Great Britain on two-way 'phone, especially G6BW, who reported us QSA5 R8 solid. Short-wave listeners reported reception of VK7WI from many countries.

Many congratulations were received on the excellence of the exhibit, and we sincerely hope that we have left a favorable impression on all those who saw 7WI in operation.

WANTED!

Can anyone devise this equipment.

The Editor, "Amateur Radio."

Dear Sir,

Here is a chance for some of the Hams who have initiative.

I am looking for a sure-fire method of detecting metallic substances, which are liable to create considerable damage during various processes used in my business, which business incidentally provides the wherewithall for my own Ham activities. So far, I am stumped.

Briefly, the process is one of feeding fibrous material, hessian, bags, etc., etc., into a carding or teasing machine. This machine has therein some hundreds of thousands of small pins on its many rollers. The clearance between the rollers is in some cases measured in thous. of an inch. Occasionally, the raw material being fed in, is received by us with metallic substances (wire, nails, nuts, bolts and such like) therein, and may be of brass or ferreous metal.

I am looking for a method which will detect these substances before they actually reach the feed rollers of the machine.

There is adequate space for installing some kind of gear on the feed table over which the fibrous materials above move very slowly—approximately 3 inches per second.

It will be seen that a magnetic apparatus is out of the question on account of the possibility of metals other than ferreuos types being present.

I wonder whether any of your readers can help me out of my difficulty. It is hopeless for me to instruct the suppliers of fibre that such metallic substances be not present.

Although I use a nom-de-plume, my enquiry is quite genuine, and you have my permission, if you so wish, to make known my name to any person who may write you on the matter.

Yours faithfully,
BI-METALLIC,
c/o W.I.A. Melbourne.

Sydney Luncheon to

Mr. James J. Malone

On Friday, August 4th, a luncheon was arranged by the I.R.E. (Aust.) and the R.I.F. Club of Sydney in honour of Mr. James J. Malone to bid him farewell from the Post of Chief Wireless Inspector of Australia, and also to offer him congratulations on his appointment as Deputy Director of Posts and Telegraphs, Queensland.

There were some 120 members of the Radio Industry present, and Sir Ernest Fisk (President of the I.R.E. was the chairman. The Wireless Institute of Australia had official representation at this gathering, which was held at the new Romano's Banquetting Hall in Martin Place. The official party was headed by Mr. W. G. Ryan (2TI), Vice-President. R. A. Priddle (2RA) and J. H. Fraser (2AFJ) were the other members of the Institute's party. Mr. Ryan spoke on behalf of the Institute.

Sir Ernest, in proposing the health of Mr. Malone, payed a glowing tribute to his work, stressing the fact that he had always been fair-minded and broad-minded, too. Mr. C. F. Marden supported the proposal, and went on to say that Mr. Malone was one of the few men who, when he had to say "no" in answer to a request, could make the person who made the enquiry feel that he had gained something from the interview.

Mr. Ryan addressed Mr. Malone as follows:—

"It is my privilege to speak on behalf of the experimental licensees in New South Wales. My association with you has been an indirect one—all matters affecting the Institute and its members were forwarded on to you per medium of our Federal Executive. Despite this fact, I am quite conversant with the courtesy and attention that you have given all matters affecting the Experimenter and the Regulations that we work under.

"During your term as Chief Inspector of Wireless, your Department granted us Experimenters quite a number of privileges, the most important being the granting of a form of self government by means of Vigilance Committees in each State of the Commonwealth. Further, the maximum power to be used without a permit was increased to 50 watts, and again that regulation dealing with interference to Broadcast Listeners and silent hours was more liberally interpreted. I assure you that these privileges have been greatly appreciated and have not been abused.

"During the year 1938, Amateurs looked towards the International Telecommunications Convention held at Cairo with some trepidation. As you gentlemen know, perhaps better than I do, all the frequencies go into the melting pot. We were a little fearful of the result. When frequencies were definitely allotted, and the smoke of battle cleared away from the Nile, Experimenters noted with no little satisfaction that Australia, represented by Mr. Malone was one of the nations that stood by the Amateur.

"Mr. Malone, I wish you every success in your position as Deputy Director of Posts and Telegraphs in Queensland, but I must say that the wish is tinged with regret, as we feel that we Experimenters are losing a good friend and advisor, but nevertheless I can pomise your successor the same co-operation as we gave you.

"Mr. Malone, on behalf of the New South Wales Division of the Wireless Institute of Australia, I would like to thank you for the consideration you have shown in the past, and again I wish you every success in Queensland, and I would like to thank the Institution of Radio Engineers

through Sir Ernest for making it possible for me, in this small way, to express the appreciation of all Experimenters."

In his reply, Mr. Malone, who appeared deeply moved by the tributes just paid to him, said he wished to thank all who had come along that day. He thanked Mr. Ryan for his good wishes and promise of loyal support to his successor, and in his concluding remarks, Mr. Malone said:

"This fascinating business of radio will go on from strength to strength, from trouble to trouble, for despite all its static there is nothing static about radio!

"It is impossible for me to forget the wrench of tearing up the roots of radio in which I have been associated for so long, but now I am going to Queensland to be a good Queenslander. I will never forget your kindness to me."

Trade Flashes

A FOUR TUBE PORTABLE SUPERHET IN KIT FORM.

Six milliamps from a 90 volt battery provides plate power for a new 1-5 volt portable, which has just been released in kit form by Crown Products, of 51-53 Murray Street, Pyrmont, N.S.W.

You will want to build one for Xmas, and your friends will want one, too.

Send a QSL card for circuit diagram and assembly instructions, and don't forget to mention "Amateur Radio."

Mr. Anderson, of Australasian Engineering Equipment Co., has promised us several articles on Test Equipment, which will prove very useful for the type of experimenting which we can and will carry on during our enforced absence from the air. This equipment is not factory made, but built by Mr. Anderson himself, and can be easily duplicated by any ham. Look for these articles in forthcoming issues.

DX Notes

By VK3MR

Uneasy lies the head that wears the cans! A very appropriate modern mis-quotation. What are we to say about things pertaining to our hobby? Don't let the fascination die, fellows, and all stick together for the sake of "Amateur Radio" and the W.I.A. I will be pleased to answer all letters now! I had some nice, juicy dx for you this month, but why make your mouth water! Eric (BERS 195) will have many rivals now, and receivers will be improved to some order and code, generally should improve, while searching the band for war news. What a treat it is on the lf end of 14 mc, and can you visualise that section of the band being full of T9 CW sigs. Too good to be true! The tumult and the shouting HAS died, just for a while I hope.

We have a good chance to check on the past activities of the dx men, by listing their dx totals, etc. So please send along your list of countries, certificates and successes in contests, etc. By working UK6WA, brings my total to 121 countries, this being confirmed after delving through thousands of cards and old log books. The following calls have proved to be "phoney" — HV1PP, HZ2GK, LZ1AK, LZ1AP, LZ1C, NZ2A, TA1AA,YN9G, YR2UR. A slight adjustment of lists may be necessary now! BERS. 195 has heard 172 countries and has 143 cards confirming same. VQ8AD ex VQ8AS, of Chagos Is., has now returned to Mauritius. VR6AY will be on the job by the time this goes to print, after his rig has been overhauled by NY2AE. I am still looking for some interesting stories of dx stations. So, what about it, chaps? "Dah De Dah" as the ECO rig said as he passed out of the band.

Station Description

By VK3MR.

There is nothing like a holiday in the country to tone up one's system, especially for a ham who, perhaps has spent more time than was good for him in the shack. This was brought home to me very forceably after the recent Bendigo convention, when I was abducted by 3BM and carried over a hundred miles of plains to his home in Quambatook, which is 200 miles N.W. of Melbourne. The whole atmosphere of the country with its vast open spaces and no hills within a hundred miles in any direction, coupled with the farming activities on the farm and the restful quietness, tempted me to return for a further period, with the intention of having a complete rest from radio, so that I could renew my own activities on returning. It turned out that I found myself amongst radio as I have never experienced before and I had a real busman's holiday, so much so, that I haven't been on the air since! The first thing that strikes you is a towering mast of 121 feet, which is the main support for all the Vee beams. These aerials are directed to Europe (16 half waves per leg on 14 mc), ditto for Japan and South Africa, and one of only 12 half waves for U.S.A. The big aerials are 558 feet long. The slope down to about 30 feet, and the feeders are all zepps, and are 200 feet long, but with only four spreaders to keep them apart, this cuts out the usual shorting at high RF potentials as at the maximum voltages. All the feeders enter the shack and can be switched on to the tuning unit at will as well as to the receiver. The gain of these ants. both in transmitting and receiving is amazing, and if I was to try and explain just how the sigs. came and left in large quantities, you might think I was romancing.

The transmitter is built into a metal rack, and is two complete jobs, The 14 mc rig is a 41 osc. 6N7 as first and second doubler 807 buffer feeding a pair of 801's in push pull link coupled to ants and running about 50 watts with 500 volts on the plates. The 80/40 mx rig is brought into operation at the turn of a switch and starts with a 6A6 to 802 and pushing a similar pair of tubes in par. All circuits have meters in them, and a volt meter is also arranged to be switched across any power supply.

The receiver is of special interest. The RF end is separate, and there is a complete set of coils and tubes for each band, divided into shielded compartments and can be selected by a rotating switch with a red light to indicate which band is coupled to the IF channel. The rf section is 6J7 RF. 6L7 Mixer and 6K7 hf. osc. The new receiver, almost finished, contains 2RF stages 1st RF. 956. 2nd 6K7G. Mixer 6L7. and hf. osc. 6F6. E.C. Two channels are on five and ten metres and are 1852—6J5 as in June QST feeding into 7 mc tuner as first IF, the 465 kc as 2nd IF. All this ends up with a G12 speaker let into the wall. The audio equipment is of special interest to fone men. The mike is a D104 to a 6J7 and xtal pick-up and the mike out put from 6J7 feeds into a 6L7 tube with a fader arrangement. This control tube is arranged for peak compression, contrast expansion or straight amplifier. For dx working, the peak compression increases the **average** speech level 4DB (nearly on R point) without over modulation. An 85 D diode triode amplifies and rectifies part of sig output to operate injector grid of 6L7 for compression purposes. Contrast expansion is used for gramo reproduction, and is performed by a 6C5 and 6H6. The former amplifies and the latter rectifies part of the input and the resultant is fed to the 6L7 injector grid. The 6L7 is followed by a 6N7 (Triodes in par) as a tone control amplifier. There are 144 different frequency response ad-

justments available. Both bass and treble can be boosted in a number of steps, the maximum boost being 30 times above normal level. By cutting out the bass, which uses quite a lot of power, and boosting the treble, greater intelligibility for dx is obtained. Treble cutting is also used to cut out needle scratch. The driver is a 6F6 as a triode transformer coupled to a pair of 807's PP. with 600 volts and the screens kept at 300 volts by using regulator tubes VR 150-30's. Battery bias is used. At normal level the modulator runs at AB1, but if more power is required it can be driven fully under AB2 to give 80 watts UPO. The IF channel, now under construction, starts with a Xtal gate with full variable selectivity. Two stages of IF (6K7's) variable selectivity IF transformers infinite impedance (inverse feed back) 6J7 as triode detector, an extra full gain stage of IF and rectifier for exceptionally effective AVC (6K7. 6H6). 6J7 BFO. 6C5 audio for fones and 6F6 feeding the speaker. Besides the above, Bruce has a 3 inch oscilloscope and associated tubes and a hundred or so knobs to make all sorts of queer patterns, and check his own modulation and yours! What a tale it tells, too. Other gear handy comprises Complete valve tester, universal meters, modulated osc. from 5 to 1500 metres and numerous other electrical gear that we see in radio cat. The most interesting thing is that he runs the lot off 32 volts farm lighting plant! Two convertors are used, one for the tranmsitter (300 watts) and a smaller one for the receiver, each producing 240 volts AC. Although the house is 6 miles from the town, everything is electrified, and the only thing lacking that the best home in the city has, is noisy electric trams! Bruce himself, between qso's grows wheat and sheep, and is in his element driving the caterpillar tractor with a variety of implements hooked on behind. Everything around the place is turned over by some kind of a machine, and manual labour is kept to a minimum as can be expected with about a dozen square miles to look after. The whole radio gear, as well as the conveniences used on the farm, proves just how much science has triumphed over the older methods, and speaks volumes for those responsible.

28—56 MC Notes

By A. Pritchard, VK3CP.

Well, we have a month of surprises and what a happy month! September 2nd brought with it the telegram, which started the wrecking operations, and visions of many pound notes going off into thin air. Sunday, September 3rd, at 9 p.m., war was announced by the BBC. Of course, it is history now, and it is unnecessary to recall the unhappy thoughts that we had. We must now push on with experiments with receivers, antennae and the like. Each month in the past I have started collecting information for the notes from the 18th; so perhaps I had better include in this issue the items I had already collected. Two things of interest are the portable rigs used by K6PIT and W9BHP portable marine, respectively. The former, using only 8 watts input to his final, had r8 signals practically any time during the mornings. The complete outfit had a 6N7g co-doub. 6N7g doub. 10 mx driving an 807 to the 8 watts. The modulator has 6N7g paralleled, driving 6N7g class B. Probably the powerful sigs were due to his lazy H type beam. W9BHP was on a boat between French Indo China and Honolulu, and his portable has 6A6 40 xtal, 20 mx output and an 807 doub final—6N7g paralleled driving another 6N7 class B for the modulator. ½ wave dipole gave us excellent signals. The ship's 110V d.c. is used with a rotary converter, and the portable's power supply takes either the a.c. or 12V d.c input. It is interesting to note that the 84 type rectifier has been standing up to 500V output at 150 mills and, considering that this is from vibrator supply, and being an indirectly heated tube, gives us a decent solution to the rectifier problem. Possibly the newer 6X5g would be just as good. Talking of vibrator power supplies, a transformer is under construction here using a shell type core, the centre dimention being an 1¼ inch across by 2½ inches long and stacked 2 inches high, the winding having 2½ turns per volt, giving 1000 turns for each secondary winding for 400 volts output, and wound with 30 gauge enamel single cotton. The primary has two centre tapped windings of 30 turns each of 14 swg enamel cotton for 6 and 12 volts inputs respectively, as the windings are paralleled when using 6 volts and are used in series for 12 volts. A 1¼-lb. reel of each gauge should be ample, depending on construction. A TCC .01mf 2000 volts working condensor must be put across the combined secondary, otherwise the rectifier would be wrecked on the high peak voltages when using vibrator primary supply. 3BQ has suggested that the lads get their receivers going well on 56 mc, and with the aid of 3 element beams, keep a look out for those elusive phones in the States. There have been so many local harmonics from 40, 20 and 10 that weak carriers have been plentiful in the past. Max has been experimenting with two converting circuits in his receiver, the 2nd being fed from a 2000 kc xtal oscillator. The line up is, 1851 rf stage, 6C6 1st det. with control grid injection from a 6C6 HFO—6C5 2nd det. and control grid injection from a 6D6 2000 KC xtal controlled oscillator, 6D6 IF amplifier at 500KC (465) into the normal 2nd det., 77 type with R meter. The results are all that could be desired, with much quieter operation, no images and higher useful gain due to less chance of feed-back with the extra converter stage—R meter readings are only down ½ on R point, from the frequency meter standard. The hams using the thick-cut 40 mx xtal will be able to use a frequency around 2333 KC or higher, depending on the position in the 7000 KC band, as these xtals are there working on their 3rd harmonic. I make a special appeal for dope on rx experiments or anything suitable for these notes vy 73's.

Afternoon Entertainment

By T. L. Simpson, VK3II.

As I have seen service in the Flying Corps, I am always interested in things up in the air, so that when I heard that 3HG was buying 4 by 4 oregon, I guessed that he was going to strengthen the floor of his shack. The next time I contacted him I asked him to let me know when he expected to upend it as I would like to take some moving pictures of the event.

In due course I was informed that, with help, he was raising the jury mast, and the big stick would be upended the next Saturday afternoon. I put on a collar and tie, loaded up my camera and set out for Coleraine.

As I neared the homestead, I could see that the big stick was not up, but seeing a pole near its position, I thought, "Well, they have the jury mast up and are waiting for me." When I got near the shack, I saw that the pole I had seen was not the jury mast, and when I got out of the car the QRM that greeted me put me wise to the fact that the jury mast did not intend to act, that Neil had only one helper, and that my collar and tie were quite out of place.

On inspection, I found that "jury mast" was not the proper name for the spar they were trying to upend, as it was a green sugar gum tree about the size of an electric light pole, and as heavy as lead.

My arrival created quite a diversion, so we had an inspection of the mast as it lay on the ground (the first of many). It was 125 feet long, in five sections of various lengths, joined by iron fish plates, with six sets of guys, four wires to the set. The foundation consisted of two hefty red gum posts set in the ground about a foot apart, with a piece of 1½ inch shafting through them on which the big stick and jury mast were hinged. The lower portion of the big stick had extension pieces of 4 by 3 hardwood bolted on to each side, and it was through these feet that the hinge went leaving a four inch space for the jury mast. The stick was lying north and south with the foundation at the north end.

The guy wires to the east and west were connected to the mast and to their correct stay posts, which were

exactly in line with the foundation and level with it, so that as the big stick lifted the guy wires would prevent it buckling. The guy wires, which were connected to the south were connected to the big stick also, and looked a tangled mass. The guys on the north side were not connected, but their ends were tied to the top of the jury mast.

After inspection and some photos we tackled the jury mast again, and with my extra strength and advice, the help of an extension ladder and a Trewalla jack we raised it about 20%, then 3HG thought that a pull from a truck or two would do the trick. So there was another interval while two trucks were got into position and connected to a cable which, passing over a smaller jury mast connected to the top of the bigger jury mast and out over the big stick. I might state that the country around 3HG is hilly and the trucks could not get much of a grip, as we soon found out. I was left at the mast, which had a rope attached to prevent it going right over, and my job was to see this did not happen, also, when the weight was taken off the ladder that it did not fall and get broken, and from my own point of view, that nothing fell on me.

Well, after much unheeded and unheard shouting, the trucks got under way, lifted the mast off the ladder, which I lowered, and grabbed the rope for the next stage. Then I saw the trucks were slipping, and was just in time to get the ladder back as the weight of the mast came on it. More councils of war, in which I was unjustly accused of hanging on to the rope. (How could they pull up the jury mast and me too). Then another volunteer arrived on a motor-bike, and we raised the mast a bit more with the ladder, and I ran my car round and hooked on to the trucks. Another concerted pull on all motors, and we drivers could see the mast was rising and we had it up to an angle of about 75 degrees. Chocks were placed behind the wheels, and we reckoned the worst was over.

The guy wires, which were attached to the jury mast were now connected to their proper positions on the big stick. The cable, with which we raised the jury mast, was slackened off, the jury guy wires holding it in place. This cable was then run back in a northerly direction and one truck attached to it. In this position he had a good pull as it was slightly down hill. After the struggle we had with the jury mast, it was child's play to upend the big stick. The truck pulled it easily, and we stopped in several positions for photos, but as it was just on sunset, I am afraid with poor results as far as a live Kodak film was concerned.

The final stage of adjusting the guy wires was done by hand, and at one period the stick assumed a shape which would have made a rainbow blush. However, as I was the only one in a position to see it, the exhibition was wasted, but my advice to pull like blazes on a guy wire half way up was carried out in quick time, and the stick assumed a more upright position.

That for me ended a very enjoyable afternoon. I was surprised at the ease of raising a tall mast, and the fun that could be got out of it. 3HG had his fun later, when he found his guy wire insulators would not stand the strain of the antennas. And he had the stick up and down quite a lot. In fact, I would suggest that if he cannot work DX with it as an aerial mast, he could work fairly good DX with it as a semaphore.

Divisional Notes

IMPORTANT

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

N.S.W. DIVISION.

President: H. F. Peterson.
Vice-Presidents: F. A. Carruthers and W. G. Ryan.
Secretary: C. T. Horne.
Treasurer: H. D. Ackling.
Notes Editor for this Division: J. H. Fraser.

At the August general meeting, Mr. John Moyle delivered a very fine lecture to a crowded meeting on "Communications Receiver Design." Mr. Moyle dealt with the design of coils, and the latest practice in the R.F. and 1st Detector stages of such receivers, and the most suitable choice of tubes. Mr. M. Meyers moved a vote of thanks, which Mr. John Pinnell supported. The motion was carried unanimously by all present.

During this period of suspension of our transmitting licenses, there is no need for us to throw in the sponge. Radio will not stand still, and one will have to keep up-to-date by reading overseas journals and carrying out their own private experimenting with the aid of small pieces of testing apparatus, such as described from time to time in this magazine, and in the A.R.R.L. Handbook.

Every ham should, in his own interests, join the Institute NOW, if he is not already a member, so that he will have a representative body to state the Ham's own case when the time comes for us to go "back on the air." The Institute is our National Organisation, and is admirably suited for this task. I commend the Editorial in this issue for your consideration. The Federal Headquarters are in Victoria, and this magazine will publish any steps that they will be taking in our own interests, and believe me, they have not been idle, because within 36 hours of the suspension of our transmitting licenses, they had held a meeting to discuss future policy and to look after our

interests. In addition, your N.S.W. Council has been meeting each week for the past month, so it is up to you fellows to continue to support the Institute.

For a start, our Division intends to organise morse classes for members of the militia signal divisions in this State, to enable those fellows who can't get morse practice at home to have a place where they can get additional practice.

The Northern Convention had to be abandoned, worse luck.

A message from the Secretary to all hams! Members or non-members alike. Please write him whenever you change your address. The reason for this is threefold. Firstly, our inwards QSL service will continue to function all the time until the last card has been sent out to its owner. Secondly, the Institute may wish to circularise everyone about an important matter, and will want to reach them quickly. Thirdly, there will be no P.M.G.'s lists now, each month with your change of address, so we want to keep track of you.

Also our Secretary wants to know of ALL HAMS in this State, who are in, or will have served in the Militia, Permanent Army, Navy, Naval Reserve, Merchant Navy, any branch of the Air Force, or any of the Communications Services of this State during the hostilities. This will include all those who are hams, or were hams in the past, and are now serving their country. We intend to keep an Honour Roll and a Register of all the activities of all hams in this State for the duration of hostilities. So please write in, or get your non-member friends to write to the Secretary and tell him just what you

are doing. In addition, if you have any difficulty in tracing any of your friends, we may be able to help you, with the aid of our register. The Box number is 1734JJ G.P.O., Sydney.

The QSL office will continue to be open at every general meeting.

Now a word from me. Please continue to support the good old magazine. It will be one way of helping you to keep in touch with "Hamdom" in Australia. If you have any ideas on how to improve the magazine, or can suggest any avenues of research to keep the Hams occupied please let me or the Magazine Committee know them. Any news of members should be sent to me to include in these notes. So the rest is up to you fellows now. Just what is done in the future rests with you.

It is pleasing to note that Waverley R. Club intends to keep going, and to train operators. Good work, Waverley, and thank you for your notes. Lakemba R. Club also intends to keep going, but I have no notes from them yet.

Finally, don't forget the Advertisers, for they will be the ones who will ultimately help to keep your magazine in print. 73 Jack.

Next meeting night, Thursday, October 19th, 8 p.m.

WAVERLEY RADIO CLUB.

"Here's to the memory of 2BV
Standing unused with silent key."

So quoth the Club's jester, and although true in the main, it calls for some explanation. Although, of course, the transmitter will no longer be heard in its accustomed place in the 40 m band, the Club's activities in the form of morse classes and the like will continue as usual.

On the 5th September, a Question Box night was held. Ivan Bailue gave us particulars of the problems he had encountered in the building of his portable equipment, and was helped over several very tricky spots by the wealth of information usually forthcoming on such occasions.

Bob Wilson, formerly of Moree, was a visitor at the Club during the last month. We hear that he is to become a member in the near future.

Gordon Wells, former president of the Club, treated us to an interesting lecture on AVC at the meeting on 26th September, explaining the fundamentals in detail and leaving no one in doubt as to "what makes the wheels go 'round."

In conclusion, I would like to invite anyone interested in radio to visit the Club rooms at rear of "Almont," 13 Macpherson Street, Waverley, on any Tuesday night. Members will doubtless be found discussing hi-fi amplifiers and new receivers instead of the number of G's and W's they have worked. F.A.B.

VICTORIAN DIVISION.

As the executive of the Victorian Division is very closely linked with the Federal Executive, we are not yet in a position to outline the policy that the Division will follow. 3WG, the Federal President, has written to all divisions, putting forward a number of suggestions and asking for comments and further suggestions. Up to the time of going to press, the replies had not come to hand, but The Notes of other divisions and the article by the Federal President gives some indication of the trend of thought.

It seems almost certain that the Division will undertake the training of new operators, and the holding of classes for raising present hams to a higher standard of efficiency, both

in code speed and technical knowledge. Arrangements are now being made for lectures on phases of radio which are barely touched by the average ham.

All members are asked to write to the Secretary of the Division stated if they are in a position to assist in the monitoring scheme and to put forward reports on overseas transmissions of news, etc., as set out in the article by the Federal President. When writing, state the times when these observations could be made and the frequencies that could be covered.

We hope to be able to give a detailed programme of work in next issue, and in the meantime, it's up to you to let us serve any constructive suggestions as to lines of research and jobs that can be done.

U.H.F. SECTION.

By 3JO.

COMPETITION RESULTS.

After distributing some 45 copies of log forms to various hams, it was very disappointing to have only six stations active in Melbourne, and only five logs were returned, thus automatically nullifying the contest. Perhaps the most unfortunate station was 3YL, who made an effort to improve her transmission by installing new modulators, but had the misfortune to strike trouble, and was unable to participate. The six stations in Melbourne were 3LG, 3LX, 3ZV, 3ZD, 3JD and 3JO, no trace being heard of any more distant signals, and none of ours were heard at 3BW.

Any further contests and other activities have, of course, been cut short by the outbreak of war, and unless otherwise decided by members, the section meetings will be eliminated, but members are asked to attend on the first Tuesday of each each month, when it is hoped to provide interesting and instructive lectures.

S. A. DIVISION.

By VK5RN.

A Council Meeting was held on Wednesday, September 6th, when it was decided to hold code classes for licensed amateurs twice weekly, in order to increase their code speed, and to get practice in methods of procedure. The student classes will, of course, be continued, as usual, and as far as possible the South Australian Division will continue just the same.

The first code class was held last Wednesday, September 13th, and a large crowd turned up, in fact, the room was practically full, although there were still one or two vacant chairs left. The class lasted for over two hours, and everyone had a turn at the key. Speeds from 12 to 25 w.p.m. were transmitted, and altogether the meeting was a great success. It is unfortunate that country members cannot take part in these classes, but a solution to this problem is being searched for, and it is hoped that this difficulty will eventually be overcome.

In future, the code classes will be divided into groups, so that each person can get more transmitting, and this scheme should also provide some QRM, which might be a help.

A public meeting will be held on Monday, 18th September, for both members and non-members, so there should be record attendance on this night.

The QSL officer is still handling cards for Australia and overseas, so now is the time to fill out all those QSL cards.

WESTERN AUSTRALIAN DIVISION.

By VK6WZ.

Where do we go from here? That is the question in the minds of many amateurs since the general QRT. At the September general meeting, suggestions were called for, and many received, including one that the division seek the opinions and co-operation of FHQ and other divisions in matters relating to making sound use of amateur skill and specialised knowledge. The suggestion to amalgamate the existing T.D.S., Field Day and U.H.F. committees into an Activities Committee was carried, and the committee-to-be was entrusted with sorting out and working upon the many suggestions put forward.

Such activities are maintaining present technical and operating standards, the exploration of wired television and cypher fields, and other possible avenues left open to experimenters are to be tackled in the near future. It is also likely that an attempt will be made to meet at more frequent intervals to keep the division together.

Students' classes are being continued at present, and high interest in these is being maintained. The new quarters in C.M.L. Buildings are modern, clean, cheerful and in the heart of the city, and are appreciated alike by students and full members (hollow and meaningless term!).

Several VK6's have been called up for the R.A.A.F. and in one quarter, a "B" class broadcasting group suffered a heavy loss of operators in one fell swoop.

The longest faces are to be seen on those chaps who bought new gear just before the outbreak of war. Our sympathy goes out to these chaps with their xtal mikes, xmitting condensers, high voltage trannies, condensers and rectifiers, bugs and new bottles! Rotten luck, fellows!

The months ahead will show where our work lies, and as the various divisions co-ordinate their ideas and work together, things should take on a more settled, even if strange, appearance.

HAMS!
DO YOU WANT TO BE BACK ON THE AIR?

The Wireless Institute of Australia

is the recognised spokesman of the AUSTRALIAN AMATEUR.

If you are not a member——

Join Now!

When the time comes that we can reasonably expect to go back on the air, we want to say that we represent——

EVERY ACTIVE HAM

in the Commonwealth.

Strengthen our hand by writing to The Secretary of the Institute in your State to-day.

All addresses are on the title page.

It is just over a year since **Trimax Transformers** opened their up-to-date factory in North Melbourne. All types of power and vibrator transformers are manufactured, as well as high fidelity audio and modulation transformers.

Amateur requirements are specially catered for as two hams are at the head of things—Mr. Harry Cliff, the secretary, and Mr. R. Peterson, in charge of the laboratory and design.

HAMADS

Advertising space in these columns is available to those wishing to sell buy or exchange.

RATES.

General 6d. per line (minimum 5 lines).

Institute Members—
Commercial, 4d. per line (minimum 5 lines).
To sell, buy or exchange used equipment, 3d. per line (minimum 4 lines).

To ensure insertion enclose remittance with copy and address to The Editor, Box 2611W G.P.O., Melbourne, or Large and Powers, 422 Collins Street, Melbourne.

ACCURATELY GROUND CRYSTALS. AT cuts, 7mc., **22/6**; 3.5 mc., **20/-**; Mounts, **8/2**, large, **9/2**; Chokes, 200 ma, **2/6**; 500ma, **5/-**; Bugs, **35/-**, postage (4lb.) extra. **VK3RJ.**, Landale St., Box Hill, Vic.

One only DEMONSTRATION MODEL SUPER SKYRIDER at Greatly Reduced Price from JOE KILGARIFF, Stanley St., Burnside, S.A. (VK5JT).

CRYSTALS... Accuracy .03%, 80 metre X cut, **10/-**; 80 metre AT cut, **17/6**; 40 metre X cut, **£1/5/-**; 40 metre BT cut. **£1/5/-**. Obtainable from **Messrs. A. E. Harold, 123-125 Charlotte St., Brisbane.**

BASSETT Concentric Cables:—There are a few 50-ft. lengths left with end seal, at less than landed cost. Write **VK3ML** for details.

HALLICRAFTERS (USA) Skyrider Communication Receivers, models covering 4 to 2150 metres. Aust. Agent: J. Kilgariff, 70 Stanley St., Burnside, S.Aus.

VK7EK apologises to quite a number of fellow hams for not answering or forwarding QSL cards.

On August 14th, he was burnt out, home, rig, clothes, cards, stores, etc., and up to the present hardly knows where he is.

Will those Hams who forwarded cards please repeat them, and those who are waiting for 7EK's give him a reminder.

Continued from page 8

4. The **Second Detector** is quite important. The diode detector seems to be the most convenient, because one is able to incorporate A.V.C. and Noise Silencing using such a detector. The latter feature is quite important in such receivers for reasons already stated.

The simple types of noise silencers are to be preferred. The Lamb type is good, but is complicated, and the adjustments are critical. The Circuit of "The Dicket Noise Silencer" is included in the paper, because it is not generally available, as yet.

5. The **Output Stage** requires careful consideration. High power output is not necessary, and it has been found that a maximum of 200 milliwatts is quite sufficient. With a small maximum output available, loud peaks are not so annoying, and a small triode, such as a 6C5 seems quite adequate. If a penthode must be used, it is suggested that its operating voltages be altered to give a maximum power output of one watt.

6. The **Power Supply** should be well filtered, and the input from the mains should be filtered, too. Finally, the receiver itself should be well shielded, because every lead is a potential input for noise, and a good aerial may be nullified by a poorly shielded receiver. This is a very broad outline of receiver design. Coils should be mounted well away from the chassis, and stand-off insulators for mounting coils are to be preferred to plug in formers of the valve base and socket type at these frequencies. The optimum wire size is No. 18 or No. 20 gauge. Every coil should be rigid, and the winding of coils on formers is quite all right, provided they are not plugged into valve sockets. All insulation should be of the best procurable, namely Trolitol or H.F. Ceramic.

ROYAL AUSTRALIAN AIR FORCE RESERVE WIRELESS SECTION

There are vacancies in all States for Amateurs desirous of enlisting in the R.A.A.F. Reserve Wireless Section. Applicants must be able to fulfil the following conditions:—

(1) Be aged between 18 and 35 years.

(2) Be of a standard of physical fitness equivalent to that required for enlistment in the Royal Australian Air Force.

(3) Be able to send and receive accurately at 16 w.p.m.

(4) Hold the Amateur Operators Certificate of Proficiency or possess qualifications of equivalent standard.

Successful applicants will be required to sign on for a period of four years in the R.A.A.F. Reserve Wireless Section, and will be called up immediately for War Service in the Royal Australian Air Force. They will be required to serve anywhere within the Commonwealth or a Territory thereof.

Here is an excellent opportunity for Amateurs, who wish to enlist in a branch of the Defence Forces, where the knowledge, experience and ability they have gained in their Hobby may be put to practical use in the Service of the Empire.

Applications should be forwarded immediately to:—

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